

Chapter 3 Closure What have I learned?

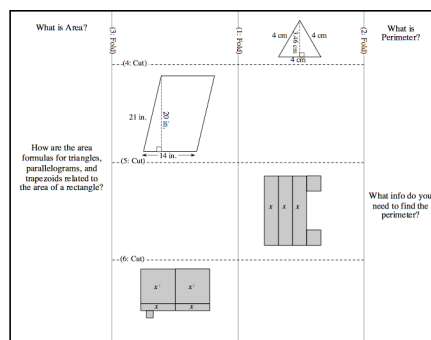
Reflection and Synthesis

The activities below offer you a chance to reflect on what you have learned during this chapter. As you work, look for concepts that you feel very comfortable with, ideas that you would like to learn more about, and topics you need more help with. Look for connections between ideas as well as connections with material you learned previously.



① SUMMARIZING MY UNDERSTANDING

You have been working with finding areas and perimeters of triangles, rectangles, trapezoids, parallelograms, and shapes created by algebra tiles. This section gives you an opportunity to showcase what you know about area and perimeter. Your teacher will provide you with instructions about how to create a “magic book.” In this book you will summarize your understanding of area and perimeter as well as show how your understanding can be used to find areas and perimeters of various shapes.



Assemble the Book: Follow your teacher’s instructions to create a special book. It will become clear later why this is called a “magic book.”

What are Area and Perimeter? Use your Toolkit, textbook, and other classroom resources to explain what you know about area. Include an explanation about how the area formulas for triangles, parallelograms, and trapezoids are related to the area of a rectangle. Diagrams might be helpful.

In your magic book, also explain what you know about perimeter. Be specific about the information you need to know about a shape in order to determine its perimeter.

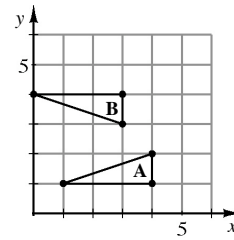
Area and Perimeter Examples: Follow your teacher’s instructions to reveal the hidden portion of the book. In this region of the book, show how to find the area and perimeter of the eight shapes in the booklet. Note: It might be easier to show the connections between the shape, its area, and its perimeter if you redraw the shape.

② WHAT HAVE I LEARNED?

Working the problems in this section will help you to evaluate which types of problems you feel comfortable with and which ones you need more help with.

Solve each problem as completely as you can. The table at the end of this closure section has answers to these problems. It also tells you where you can find additional help and practice on problems like them.

- CL 3-109. Matt moved Triangle A on the graph at right to match up with Triangle B in three moves. Follow the steps Matt wrote below. What was his final move?



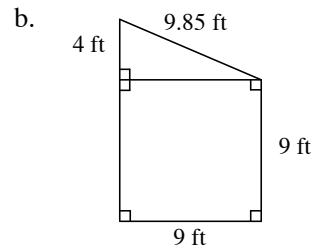
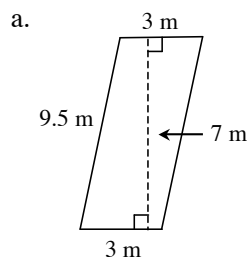
1. *Slide the triangle up 3 units.*
2. *Reflect the triangle across the line $y = 4$.*
3. ?

- CL 3-110. Using a method of your choice, find the products of the following fractions.

a. $\frac{3}{4} \cdot \frac{1}{4}$

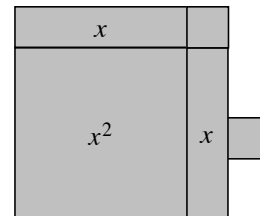
b. $\frac{4}{5} \cdot \frac{4}{3}$

- CL 3-111. Copy each figure below on your paper. Assume that the shape in part (a) is a parallelogram. Find the area and perimeter of each shape. Show all your work.



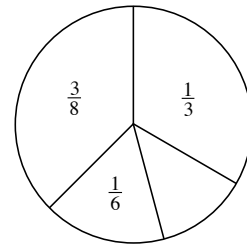
- CL 3-112. Sketch the shape made with algebra tiles at right on your paper. Then answer parts (a) through (c) below.

- a. Find the perimeter of the figure.
- b. Find the area of the figure.
- c. If the algebra tiles were rearranged how would the area change?



CL 3-113. Julia has two children who are four years apart in age. Julia is four times older than her youngest child. The sum of the ages of Julia and her children is 76 years. Use the 5-D Process to find the ages of Julia and each of her children.

CL 3-114. Robert found a spinner for a game that was not completely labeled. The spinner is shown at right. Help Robert figure out what fraction of the spinner is missing.



CL 3-115. Evaluate each expression for the given variable.

a. $3a - 7$ when $a = 2$

b. $8 + 5m$ when $m = -2$

c. $13 + (-3n)$ when $n = 4$

d. $\frac{x}{3} + 2$ when $x = 6$

CL 3-116. Copy and simplify each expression.

a. $7(5 - 1) + (-3) - 2^2$

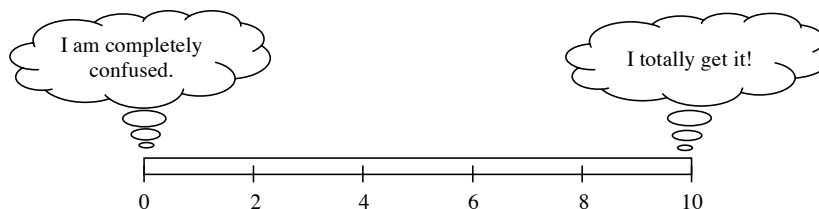
b. $2 \cdot 7 + (-5)(3) - 4$

c. $6 - (-2) + (-5 + 8)$

d. $-2 + 3(3 \cdot 2) - 3^2$

CL 3-117. For each of the problems above, do the following:

- Draw a bar or number line that represents 0 to 10.



- Color or shade in a portion of the bar that represents your level of understanding and comfort with completing that problem on your own.

If any of your bars are less than a 5, choose *one* of those problems and do one of the following tasks:

- Write two questions that you would like to ask about that problem.
- Brainstorm two things that you **DO** know about that type of problem.

If all of your bars are a 5 or above, choose one of those problems and do one of these tasks:

- Write two questions you might ask or hints you might give to a student who was stuck on the problem.
- Make a new problem that is similar and more challenging than that problem and solve it.

③ WHAT TOOLS CAN I USE?

You have several tools and references available to help support your learning – your teacher, your study team, your math book, and your Toolkit to name only a few. At the end of each chapter you will have an opportunity to review your Toolkit for completeness as well as to revise or update it to better reflect your current understanding of big ideas.

The main elements of your Toolkit should be your Learning Log, Math Notes, and the vocabulary used in this chapter. Math words that are new to this chapter appear in **bold** in the text. Refer to the lists provided below and follow your teacher's instructions to revise your Toolkit, which will help make it useful for you as you complete this chapter and as you work in future chapters.

Learning Log Entries



- Lesson 3.1.2 – Variables
- Lesson 3.1.3 – Combining Like Terms
- Lesson 3.1.4 – Perimeter and Area Using Algebra Tiles
- Lesson 3.2.4 – Defining and Deciding

Math Notes

- Lesson 3.1.1 – Area of Trapezoids
- Lesson 3.1.2 – Naming Algebra Tiles
- Lesson 3.1.3 – Combining Like Terms
- Lesson 3.1.4 – Evaluating Expressions
- Lesson 3.2.3 – Solving Problems With the 5-D Process
- Lesson 3.2.4 – Consecutive Integers



Mathematical Vocabulary

The following is a list of vocabulary found in this chapter. The words in bold are the words new to this chapter. It is a good idea to make sure that you are familiar with these words and know what they mean. For the words you do not know, refer to the glossary or index. You might also want to add these words to your Toolkit for a way to reference them in the future.

5-D process

combining like terms

equivalent

simplified

algebraic expression

constant

evaluate

term

coefficient

consecutive integers

factor

variable

Process Words

These words describe problem solving strategies and processes that you have been involved in as you worked in this chapter. Make sure you know what each of these words means. If you are not sure, you can talk with your teacher or other students or look through your book for problems in which you were asked to do these things.

calculate

define

evaluate

predict

rewrite

decide

describe

illustrate

represent

simplify

declare

draw

organize

reverse your thinking

visualize

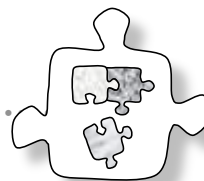
Answers and Support for Closure Activity #2

What Have I Learned?

Problem	Solution	Need Help?	More Practice
CL 3-109.	Slide the triangle left 1 unit.	Lessons 2.2.1 and 2.2.2 Math Notes box in Lesson 2.2.3 Learning Log (problem 2-66)	Problems CL 2-158, 3-9, 3-52, and 3-107
CL 3-110.	a. $\frac{3}{16}$ b. $\frac{16}{15}$	Lesson 2.3.1	Problems CL 2-161, and 3-40
CL 3-111.	a. Area: 21 square meters Perimeter: 25 meters b. Area: 99 square feet Perimeter: 40.85 feet	Lessons 2.3.2 through 2.3.5 Math Notes boxes in Lessons 2.3.2 through 2.3.5 Learning Logs (problems 2-126 and 2-150)	Problems CL 2-163, 3-10, 3-19, 3-60, and 3-103
CL 3-112.	a. $P = 4x + 6$ units b. $A = x^2 + 2x + 2$ square units c. The area would not change.	Lessons 3.1.1, 3.1.2, 3.1.3, and 3.1.5 Math Notes boxes in Lessons 3.1.2 and 3.1.3 Learning Logs (problems 3-28 and 3-37)	Problems 3-7, 3-13, 3-14, 3-15, 3-20, 3-24, 3-29, 3-38, 3-45, 3-71, 3-88, and 3-108
CL 3-113.	Julia is 48. The children are 12 and 16.	Lessons 3.2.2, 3.2.3, 3.2.4, and 3.2.5 Math Notes box in Lesson 3.2.3 Learning Log (problem 3-98)	Problems 3-67 through 3-70, 3-76 through 3-81, 3-89 through 3-96, 3-104, and 3-105

Problem	Solution	Need Help?	More Practice
CL 3-114.	$\frac{3}{24}$ or $\frac{1}{8}$	Lessons 1.2.4 and 1.2.5 Math Notes box in Lesson 1.2.4 Learning Log (problem 1-107)	Problems CL 1-140, and CL 2-160
CL 3-115.	a. -1 b. -2 c. 1 d. 4	Lesson 3.1.4 Math Notes box in Lesson 3.1.4 Learning Log (problem 3-17)	Problems 3-34, 3-38, 3-49, 3-62, and 3-85
CL 3-116.	a. 21 b. -5 c. 11 d. 7	Lessons 2.1.1, 2.1.2, 2.1.3, and 2.3.6 Math Notes boxes in Lessons 2.2.1 and 2.3.6 Learning Log (problem 2-39)	Problems 2-152, 3-30, 3-72, 3-87, and 3-100

Puzzle Investigator Problems



PI-5. WEIGHING PUMPKINS

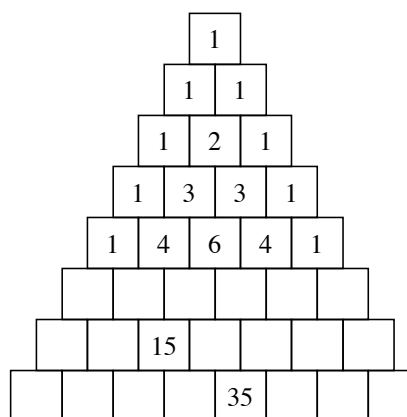
Every year at Half Moon Bay, there is a pumpkin contest to see who has grown the largest pumpkin for that year.

Last year, one pumpkin grower (who was also a mathematician) brought 5 pumpkins to the contest. Instead of weighing them one at a time, he informed the judges, “*When I weighed them two at a time, I got the following weights: 110, 112, 113, 114, 115, 116, 117, 118, 120, and 121 pounds.*”

Your task: Find how much each pumpkin weighed.

PI-6. PASCAL’S TRIANGLE

The number pattern started at right is called **Pascal’s Triangle**. While it looks like a simple arrangement of numbers, it has many interesting patterns within it. In this challenge, you will learn more about the hidden patterns of Pascal’s Triangle.



- Using the PI-6 Resource Page (which you can download at www.cpm.org/students), use the patterns to complete the missing numbers. Some of the numbers are given so you can check your work.
- What is the sum of the 20th row of the triangle? Can you find this without extending the triangle? Explain how you found your answer.
- Using a see-through highlighter, color in the squares that contain odd numbers. Describe the pattern that emerges.
- Find at least three other patterns in Pascal’s Triangle that you have not described so far.